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Securing and enhancing access to land for smallholders in shifting cultivation systems
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The persistence of shifting cultivation as the main deforestation driver in north-eastern Madagascar – the complex underpinnings of a local exception to a global trend

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The drivers of deforestation have been changing in the last decades from smallholder's cropland expansion to the increase of industrial agricultural and livestock production spurred by international demand for commodities produced in the world's tropical regions. However, in the biodiversity hotspot of north-eastern Madagascar small-scale farmers are still held responsible for the humid forest retreat. The major activity behind this dynamic is shifting cultivation for rain-fed rice production, which across this region is regulated through a complex tenure system at the family or clan level. Under customary law the person who first clears a plot of forest is considered the rightful owner. The international conservation and development community has been trying to slow deforestation through a fortress conservation model. The underlying assumption is that through agricultural intensification and diversification strategies in the periphery of the protected areas, the reliance of local farmers on shifting cultivation could be reduced. Notwithstanding, the success of this approach remains elusive, to a large extent due to significant knowledge gaps and methodological challenges that undermine the adequacy of these initiatives in such complex social-ecological landscapes. In this regard, evidence on the change trajectories and current state of shifting cultivation landscapes has been mainly narrative and based on few case studies, while understanding of the multiple benefits local populations enjoy from different land uses remains incomplete.

To illuminate these aspects we conducted land-cover change analysis for the periods between 1995, 2005 and 2011, which confirmed that deforestation in north-eastern Madagascar occurred mainly through shifting cultivation. This process largely targeted small forest fragments outside of protected areas, leading to a homogenization of landscapes. Furthermore, with a landscape mosaic approach, we showed that in several areas of the region and especially around the protected area of Masoala a trend of intensification (more irrigated rice production than shifting cultivation) was under way. Combining this information with over 1,000 household surveys in 45 villages distributed throughout the region, we further documented the involvement of households in different land use strategies. This empirical data revealed that despite the intensification trend almost 20% of households continues relying exclusively on shifting cultivation, while another 60% combines this practice with permanent irrigated production to meet their rice needs. In addition, ongoing research is providing evidence about the significance of the ecosystem services provided by shifting cultivation fallows to the well-being of local households, particularly given the recently observed trend of conversion of shrub fallow land into agroforestry plots for cash production.

Shifting cultivation will likely remain an important strategy to assure local food security and to secure a bundle of ecosystems services essential for the well-being of local land users and their descendants in north-eastern Madagascar. Among the reasons for the persistence of this land-use system are the lack of access to irrigated rice paddies, high risks associated with cash crop production (clove and vanilla), and very few job opportunities available outside the agricultural sector. In a situation of uncertainty due to the closure of the forest-frontier through protected areas, securing access to land, inputs, technical knowledge, and markets for these populations might be a critical step on the way towards a more sustainable development in this global biodiversity hotspot.